IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicants:	Nadeem AHMED et al.	§	Confirmation No.:	3979
Serial No.:	09/865,238	§	Group Art Unit:	2661
Filed:	May 25, 2001	§	Examiner:	C. Q. Ware
For:	Joint Detection In OFDM Systems	§	Atty. Docket No.:	1789-04801

SUMMARY OF CLAIMED SUBJECT MATTER

Mail Stop Appeal Brief - Patents
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Sir or Madam:

In response to the Notification of Non-Compliant Appeal Brief March 08, 2007, and pursuant to MPEP 1205.03(b), appellants file this Summary of Claimed Subject Matter. Page numbers in this document correspond to appropriate insertion points in the Appeal Brief.

Respectfully submitted,

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V. SUMMARY OF CLAIMED SUBJECT MATTER

This section provides a concise explanation of the subject matter defined in each of the independent claims involved in the appeal, referring to the specification by page and line number or to the drawings by reference characters as required by 37 CFR § 41.37(c)(1)(v). Each element of the claims is identified with a corresponding reference to the specification or drawings where applicable. Note that the citation to passages in the specification or drawings for each claim element does not imply that the limitations from the specification and drawings should be read into the corresponding claim element.

Appellants disclose a communications system having an improved receiver designed to combat inter-channel interference ("ICI") in orthogonal frequency division multiplexing ("OFDM") modulated signals. p.7 ℓ.6–10. The receiver may also be designed to combat inter-symbol interference ("ISI") in OFDM modulated signals. p.7 ℓ.6–10. The receiver includes an analog-to-digital (A\D) converter, transform module, and a detection module. p.6 ℓ.16–17; p.7 ℓ.11–13; p.8 ℓ.5–9; p.8 ℓ.15–p.9 ℓ.6. The A/D converter samples the corrupted OFDM-modulated signal to obtain a digital receive signal. p.6 ℓ.16–17. The transform module determines frequency component amplitudes of the digital receive signal. p.7 ℓ.11–13. The detection module determines a channel symbol from the frequency component amplitudes while compensating for correlation between the frequency components. p.7 ℓ.11–13; p.8 ℓ.5–9; p.8 ℓ.15–p.9 ℓ.6. In a preferred implementation, the detection module calculates for each frequency component, a weighted sum of the frequency component amplitudes from the transform module. p.10 ℓ.8–11. The weighted sum is preferably designed to minimize expected error energy observed by the decision element. p.10 ℓ.8–11.

Claim 1 recites a communications receiver that includes an analog-to-digital converter 26, a transform module (FIG.2 34; alternatively matched bandpass filters in p.7 ℓ.11–18), and a detection module (FIG.3 38 304). The analog-to-digital converter 26 samples a DMT (discrete multi-tone) signal to obtain a digital receive signal (FIG.2; p.6 ℓ.3–4). The transform module is coupled to the analog-to-digital converter 26 to determine amplitudes associated with frequency components of the digital receive signal. p.6 ℓ.7–8 ("Fourier Transform"); p.7 ℓ.11–18 ("matched bandpass filter outputs"). The detection module determines a channel symbol from the amplitudes

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(FIGS. 3–5 38) while accounting for correlation **between the amplitudes** (p.7 ℓ.11–18; p.8 ℓ.5–9; p.8 ℓ.15–p.9 ℓ.6).

Claim 2 recites a communications receiver that includes an analog-to-digital converter that samples a discrete multi-tone ("DMT") signal to obtain a digital receive signal. p.6 ℓ.16–17. The receiver also includes a transform module coupled to the analog-to-digital converter and configured to determine amplitudes associated with frequency components of the digital receive signal. p.7 ℓ.11–13. The receiver further includes a detection module configured to determine a channel symbol from the frequency component amplitudes while accounting for correlation between the frequency component amplitudes of the digital receive signal. p.7 ℓ.13–14; p.8 ℓ.15–p.9 ℓ.6. The detection module determines the **most probable channel symbol given the amplitudes** determined by the transform module. p.9 ℓ.7–8.

Claim 3 recites a communications receiver that includes an analog-to-digital converter that samples a discrete multi-tone (DMT) signal to obtain a digital receive signal. p.6 ℓ.16–17. The receiver also includes a transform module coupled to the analog-to-digital converter and configured to determine amplitudes associated with frequency components of the digital receive signal. p.7 ℓ.11–13. The receiver further includes a detection module configured to determine a channel symbol from the frequency component amplitudes while accounting for correlation between the frequency component amplitudes of the digital receive signal. p.7 ℓ.13–14; p.8 ℓ.15–p.9 ℓ.6. The detection module includes a weighted sum unit associated with each frequency component, and each **weighted sum** unit combines amplitudes from the transform module in a manner designed to **minimize any error** between the output of the weighted sum unit and a valid output value. p.10 ℓ.8–11.

Claim 6 recites a communications receiver that includes an analog-to-digital converter that samples a DMT signal to obtain a digital receive signal. p.6 ℓ.16–17. The receiver also includes a transform module coupled to the analog-to-digital converter and configured to determine amplitudes associated with frequency components of the digital receive signal. p.7 ℓ.11–13. The receiver further includes a detection module configured to determine a channel symbol from the frequency component amplitudes while accounting for correlation between the frequency component amplitudes of the **digital receive signal**. p.7 ℓ.13–14; p.8 ℓ.15–p.9 ℓ.6. The receiver

also includes a time domain equalizer that operates on the digital receive signal to maximize a percentage of impulse response energy in a predetermined interval. p.6 ℓ.17–18.

Claim 11 recites a method of receiving OFDM modulated data. One element of the method comprises determining a set of frequency component amplitudes associated with a channel symbol interval of a receive signal. p.6 ℓ.7–8; p.7 ℓ.11–18. Another element of the method comprises determining a channel symbol associated with the set of frequency component amplitudes while accounting for correlation between the frequency component amplitudes associated with the channel symbol interval of the receive signal. FIGS. 3–5 38; p.7 ℓ.11–18; p.8 ℓ.5–9; p.8 ℓ.15–p.9 ℓ.6.

Claim 14 recites a method of receiving OFDM modulated data. One element of the method comprises determining a set of frequency component amplitudes associated with a channel symbol interval of a receive signal. p.6 ℓ.7–8; p.7 ℓ.11–18. Another element of the method comprises determining a channel symbol associated with the set of frequency component amplitudes while accounting for correlation between the frequency component amplitudes associated with the channel symbol interval of the receive signal. FIGS. 3–5 38; p.7 ℓ.11–18; p.8 ℓ.5–9; p.8 ℓ.15–p.9 ℓ.6. Determining a channel symbol comprises determining a product of a matrix M and the set of frequency component amplitudes, wherein the matrix M includes at least two non-zero values in each row. p.10 ℓ.13–18; p.11 ℓ.22–23;

Claim 19 recites a communications system that comprises a transmitter and a receiver. The transmitter transmits an OFDM modulated signal. FIG.1 10–20; p.5 ℓ.19–p.6 ℓ.8. The receiver receives and demodulates a corrupted version of the OFDM modulated signal. FIG.2 26–40; p.6 ℓ.6–10. The receiver includes an analog-to-digital converter 26, a transform module (FIG.2 34; alternatively matched bandpass filters in p.7 ℓ.11–18), and a detection module (FIG.3 38, 304). The analog-to-digital converter 26 samples a DMT (discrete multi-tone) signal to obtain a digital receive signal. FIG.2; p.6 ℓ.3–4. The transform module is coupled to the analog-to-digital converter 26 to determine amplitudes associated with frequency components of the digital receive signal. p.6 ℓ.7–8 ("Fourier Transform"); p.7 ℓ.11–18 ("matched bandpass filter outputs"). The detection module determines a channel symbol from the amplitudes (FIGS. 3–5 38) while accounting for correlation **between the amplitudes** (p.7 ℓ.11–18; p.8 ℓ.5–9; p.8 ℓ.15–p.9 ℓ.6).